

# THE EFFECTIVENESS OF THE EUROPEAN ECONOMIC RECOVERY PLAN

The fiscal policy multiplier

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**Abstract**

The European Economic Recovery Plan (EERP) was a large stimulus package initiated by the European Commission and the euro member states to tackle the negative effects of the global financial crisis. This thesis studies the effectiveness of EERP by reviewing the studies behind the fiscal policy multiplier. The primary focus is on the newest research in the euro area context.

Based on the literature review, it's evident that EERP had positive effects on the real GDP growth. The focus of this thesis was both on the theories and models on the determinants of effective fiscal policy and on empirical studies estimating the multiplier. When EERP was launched, interest rates were closing the zero lower bound, which historically and theoretically leads to more effective fiscal policy.

Several studies that use modern DSGE-models with the assumptions of co-existing Ricardian and non-Ricardian households estimate the fiscal policy multiplier for the EERP to have been positive but under unity in the short run, in the zero-interest context that prevailed. In the long run, the effects were estimated to be more moderate, under some assumptions even negative. The studies suggest that the expenditure-side actions were more effective compared to the revenue-side actions. The argument that the growing debt levels in the euro area would ultimately undermine the fiscal stimulation and reduce the multiplier is one of the complexities beyond this review.

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**Keywords** fiscal policy multiplier, fiscal stimulus, European Economic Recovery Plan, zero lower bound, revenue side fiscal policy action, government spending, rule-of-thumb households

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# 1 Introduction

In recent years, there has been a lot of discussion and research around the subject of fiscal policy and its effectiveness. Fiscal policy is used by the government to affect the economy and it consists of the revenue side, i.e. collecting taxes, and the expenditure side, i.e. deciding the government's spending. The use of fiscal stimulus packages, e.g. The European Economic Recovery Plan (EERP) after the recent financial crisis, has created a lot of discussions and there have been many studies made about the short term economic effects of these packages. These studies try to find out what is the size of the fiscal policy multiplier meaning the rise in GDP relative to the size of the policy intervention (Auerbach et al., 2010).

The fiscal policy multiplier has been a subject for a lot of debate and still there isn't a consensus among the economists. Fiscal policy is a vital part of economic policy and therefore the size of the fiscal policy multiplier has a direct effect on the decisions that the politicians make regarding government spending.

The recent financial crisis, which has been described as the most devastating crisis since the great depression, has given the opportunity to economic research to study the effects of the fiscal stimulus packages made in the new economic environment. After a few years since the crisis began, studies have been made to determine whether the applied stimulus packages worked and if they worked then why.

This paper is a literature review that reviews the recent academic research around the government spending multiplier and it focuses on European countries and the estimates made on the relevant data. It takes a look at the background the fiscal stimulus packages have had and reviews the basics assumptions and determinants of the models used for the estimates.

## 1.1. Previous research

The dynamic effects of government spending have been researched since the 1930s. There is a consensus that the fiscal multipliers exist but the debate is whether these multipliers are large or

small. Blanchard and Perotti (1999) argue that government spending shocks have a positive effect on output and positive tax shocks as having a negative effect, even though these multipliers are typically low. Before the financial crisis started, Krugman (2005) argued that fiscal policy as a tool of stabilization policy is set to come back, and that discretionary fiscal policy should be used with monetary expansion during a slow-down. These studies have been conducted in a different economic background, thus the focus of this thesis is on newer studies.

In the current literature, the fiscal policy multipliers have been studied quite intensively due to the new economic situation which was created by the global financial crisis. Hall (2009) finds out that government spending multipliers are positive with New Keynesian models, even though the key mechanisms in the model can be put under critical evaluation. Auerbach et al. (2010) state that there is robust evidence that well-designed tax cuts can stimulate economy in the short run but the indirect effects are not so robust. Studies regarding the European Economic Recovery Package, also found positive but below unity multipliers in the short-run (e.g. Cwik & Wieland, 2011; Coenen et al., 2013). The assumptions and models of these models vary greatly, therefore a closer look is required.

Based on the literature, it is clear that the multipliers exist and this raises the question of what are the key elements of the economic situation which affect the multiplier. The response of the monetary policy has naturally an effect on the multiplier. Christiano et al (2009) have found that the multiplier can be especially effective when the economy is at what they call the zero lower bound (see below). It matters whether the fiscal policy actions are focused on the revenue- or the expenditure-side e.g. Forni et al (2009) suggest that actions on the revenue side have more significant effects. The assumptions of how households act based on the changes in government spending i.e. are households Ricardian or non-Ricardian agents is a factor when determining the multiplier (e.g. Gali, 2007). We can see that there exist many determinants of the fiscal policy multiplier and this thesis reviews the current literature on some of the aspects.

## 1.2 Research goals

The main objective of my thesis is to review relevant studies of the impact of government spending to GDP in the European countries under the circumstances that arose after the financial crisis of 2007-2008. This thesis will focus on finding and critically assessing the factors that are in play when estimating the government spending multiplier. The topic is relevant since governments make their fiscal policy decisions partly based on the recommendations arising from such studies.

After the introduction to my topic, I will do a short review of the financial crisis of 2007-2008 and the actions that followed the crisis. I review the economic situation that was present when EU and USA announced their crisis actions regarding monetary and fiscal policy. What were the key elements of the economy that had the potential to make fiscal policy effective in the aftermath of the crisis? What were the reasons that the traditional response of monetary policy was considered to be insufficient?

In the third chapter, I will review the basics of the different economic theories such as: neoclassical, old Keynesian and New Keynesian, for the purpose of being able to understand why the results of different studies vary so greatly. Not surprisingly, the key to the differences in results lies in the differences in assumptions. In this chapter, I will also examine the different models used to calculate government spending multipliers and take a closer look on the New Area Wide Model which is a DSGE-model used by the ECB.

In the fourth chapter, the main emphasize is on reviewing the literature on different aspects regarding the government spending multiplier. This chapter tries to answer the following questions: How does the interest rates and monetary policies affect the multiplier? How does the behavior of households affect the multiplier? How does the form of additional government spending and government debt affect the multiplier? The main focus will be on the literature that studies the effects of the European Economy Recovery Plan, while the secondary focus being on studies made in the USA for example.

## 2 The background of the economy

In this chapter, the background of the economy is established through taking a closer look of the global financial crisis and the economic policy responses taken in the aftermath. Furthermore, EERP, the European Commission's fiscal stimulus package is discussed in detail.

### 2.1 The financial crisis of 2007-2008

The financial crisis of 2007- 2008 can be divided into two distinct phases. The first phase was the subprime mortgage crisis whose source was the decline in U.S. housing market that had peaked in 2005. The decline of the housing market led to great losses in mortgage-backed financial securities and eventually spread to the global financial markets. This phase of the crises ended when Lehman Brothers entered bankruptcy on September 15, 2008. Next day, on September 16, 2008, insurance company AIG collapsed. The second phase, i.e. the global financial crisis, had started and the world economy fell at an annual rate of -6.4% in the fourth quarter of 2008 and -7.3% in the first quarter of 2009. (Mishkin, 2011)

The global financial crisis created the need for various policy responses. Along the traditional and unconventional monetary policy, both the United States and EU issued considerably large fiscal stimulus packages. In other words, they pursued expansionary fiscal policy in order to boost aggregate demand. Other monetary policy measures that the European central bank (ECB) has taken are e.g. long term refinancing operations (LTRO) and quantitative easing i.e. purchasing bonds from the secondary markets to get the market work properly and get the inflation rising.

In Europe, the downfall of the economy was significant. The annual GDP growth rate was negative for five consecutive quarters, starting on the last quarter of 2008 and peaking at -5.5% on the first quarter of 2009 (appendix 1). The annual growth rate then turned back positive for a couple of years but then fell again in the first quarter of 2012 at the same time when the second bailout package for Greece was finalized.

The fall of the annual growth rate of GDP wasn't the only real-economy effect that followed the financial crisis in Europe. The government debt levels, meaning the government debt as a percent

of GDP, have risen significantly since the crisis started. In the euro area, the overall government debt is now in the second quarter of 2016 at over 90% compared to the 65% before the crisis (appendix 2). Also, the unemployment rates as a % of labor is considerably larger than before the crisis (appendix 3). On the other hand, inflation has been less than 1% for over three years now which is significantly less than the official target of EU (appendix 4).

All of these economic statistics are factors determining whether additional fiscal policy measurement should be applied to the current economic situation. In the following chapters I try to study how the different economic factors affect the size of fiscal policy multiplier. The greatest emphasis is given on interest rates and monetary policy.

## 2.2 Fiscal stimulus in the euro area.

In EU, each national government is responsible for its own fiscal policy. In the euro area, monetary policy is decided by the ECB, leaving fiscal policy be a major tool for national government to deal with country-specific circumstances, even though these policies are governed by the Stability and Growth Pact (SGP) which is the EU's common fiscal framework (ECB, 2016). According to ECB, the focus has shifted in the direction of assessing the fiscal policies of the aggregate euro area perspective and determining the fiscal stance on an aggregate level. Fiscal stance means the future impact that follows government spending and taxation. ECB states that the decentralized fiscal framework does not lead to the optimal appropriate stance at the euro area level even though the determining what is the optimal euro area fiscal stance is not straightforward. In conclusion, for the time being national governments make their own fiscal policies independently and the SGP is only a framework that has been proven weak from a practical standpoint.

After the financial crisis hit Europe, the European Commission announced The *European Economic Recovery Plan (EERP)* at the end of 2008. EERP had two pillars of which the first one is of relevance here. It was a straight measure of coordinated fiscal policy. The European Commission (2008) described the first pillar as a major injection of purchasing power into the economy, to boost demand and stimulate confidence. The recovery plan's fundamental principle was solitary and social justice i.e. action must be geared to help those most in need (The European Commission, 2008). The United States had a similar plan called the American Recovery and



Reinvestment Act (ARRA). In this thesis, the emphasis is mainly on reviewing the research on the effects of EERP, but some studies on ARRA are reviewed as well.

The commission proposed that the member states and the EU agree to an immediate budgetary impulse amounting to € 200bn which is 1.5% of GDP. These planned actions didn't have a specific time period. According to Watt & Nikolova (2009), in reality the discretionary measures totaled only around 1% of GDP in 2009 and 0.6% in 2010, see table 1. They argued that these figure are too low. In the table, revenue side includes mostly tax cuts of various sort. Expenditure side can be seen as changes in government purchases. In the following chapters, studies on the economic effects of EERP are reviewed.

**Table 1 Based on 10-14 EU countries, depending on the indicator, representing approx. 80-90% of EU27 GDP**

	Simple average	Weighted average
Total fiscal package 09/10	1.70	1.79
in 2009	0.99	1.02
in 2010	0.61	0.59
revenue side	52%	52%
expenditure side	48%	48%

Table 1: Stimulus package as % of GDP

Source: Watt, A., & Nikolova, M. (2009).

### 3 Theoretical framework

In this chapter, I review the theoretical frameworks and models that have been used to calculate estimates for the fiscal policy multipliers. In macroeconomic theory, we can see different kind of approaches to calculating the overall economic effects. I break down the traditional Keynesian multiplier and explain it thoroughly to emphasize the basic idea behind the multiplier. Then I show the main points of macroeconomic theories that are considered the most important ones in the economic to highlight the background for better understanding the models.

### 3.1 Macroeconomic models

**The traditional Keynesian** theory explains, using econometric models, the short-run effects of monetary and fiscal policies practiced by the governments. The theory doesn't take into account the extent to which households benefiting from additional government expenditures anticipate the future tax increases needed to pay for the expenditures. In other words, the marginal propensity of households to consume any additional incomes is assumed to stay constant when governments change their policies.

The classical macroeconomic textbooks show us the Keynesian multiplier which can produce quite high multipliers. These are questioned nowadays. In the simplest form the multiplier is shown in the Keynesian cross diagram (see figure 1), where on the vertical axis is the production and on the horizontal axis is the income. Because production and income are identical, therefore the relationship between them can be shown as a 45-degree line. ZZ is the desired demand which shows the relationship between demand and income. The framework can be interpreted as follows. An increase in demand (A --> B) leads to an equal increase in production. This leads also to an increase in income (B --> C) which is equal to the amount of increase in production. The next round increase is only a portion of the increase in income because consumers are only willing to spend a part of the additional income ( $mpc = \text{marginal propensity to consume}$ ). This leads to a geometrical sum that can be calculated as  $1 / (1 - mpc)$ . So in basic theory the multiplier should be in absolute value bigger than one.

In reality the multiplier is much lower due to many reasons. It doesn't count the effect of imports. Also the forward-looking behavior of the households and hence the extent to which private consumption is crowded out by fiscal expansion is overlooked. The model can be modified to take into account of the effect of marginal propensity to import ( $m$ ) which leads to lower multiplier. The new multiplier can be written  $1 / (1 - mpc + m)$ . Still the estimates are completely different from those calculated using today's models.

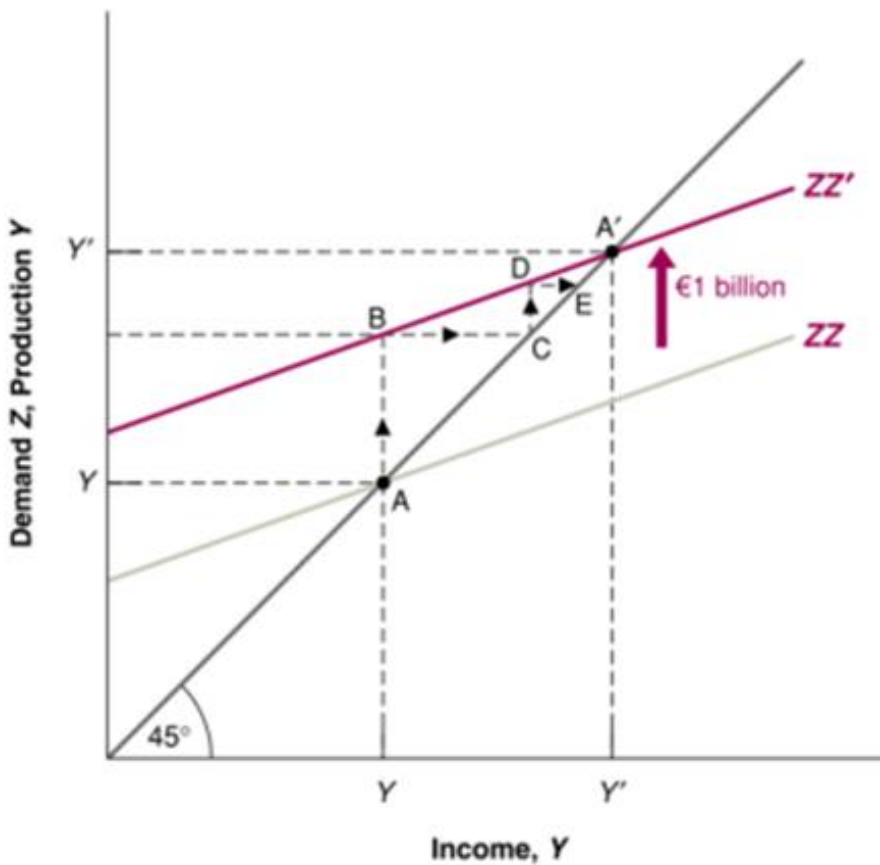


Figure 1: Keynesian multiplier

Source: Macroeconomics: A European Perspective: Blanchard 2010

**Neoclassical models** take a microeconomic approach to macroeconomic problems and the base assumption is that firms and households make their decisions with perfect information. In neoclassical models, there are three different kind of markets where agents make utility- and profit-maximizing decisions: Labor markets, commodity markets and capital markets. In neoclassical models, prices are fully flexible. Nowadays neoclassical models have developed into Real Business Cycle (RBC), which is a new classical model that takes into account exogenous shocks. Shock can be for example new technologies that disrupt the market.

**New Keynesian models** acknowledge the fact that there are market failures and that wages and prices can be sticky i.e. prices don't adjust right away in the short term. Nowadays New Keynesian models have taken tools originally associated with RCB theory, such as the use of DSGE-models

where the behaviors of households and firms are optimized meaning there can be monopolistic competition, rational expectations, market clearing, etc. (Gali, 2008). But on top of adopting tools from RBC theory, there are features that make the New Keynesian models distinctly Keynesian. Gali lists three. First, there is monopolistic competition, meaning that firms set prices to maximize their profits. Second, there are nominal rigidities, meaning that firms and households have some restrictions when setting the prices and wages. This implies that the agents must be forward-looking. Lastly, monetary policy is non-neutral in the short run because the prices don't adjust right away. Gali also mentions that one important characteristic of the New Keynesian model is that it can be modified to take into account open economy features, unemployment and credit frictions for example.

### 3.2 Models used to calculate the fiscal multiplier

Three types of models have been used for studying the overall economic effects: large-scale macroeconomic models, structural vector autoregressions (SVAR) and dynamic stochastic general equilibrium (DSGE) models (Auerbach et al., 2009). In this thesis, the emphasis is on the studies made using DSGE or SVAR models due to the fact that researchers find them the most relevant. Many of the existing papers studying the effects of EERP have used New Keynesian DSGE models, for example Fève & Sahuc (2015), Coenen et al. (2013), Cwik & Wieland (2011). On the other hand, papers studying data from a longer time period have relied on SVAR models (e.g. Blanchard & Perotti, 2009; Burriel et al., 2010; Ilzetzi et al., 2013).

As stated earlier, the new generation of DSGE-models are a common tool for studying the effects of different macroeconomic policies. These are models derived from microfoundations e.g. optimized behavior of consumers and firms, rational expectations and nominal rigidities (Blanchard, 2008). According to Blanchard these models are used for evaluating policy rules and to do conditional or actual forecasting. Still these models have many flaws even though they are used and developed in almost every central bank for the purposes mentioned earlier. For demonstrating what a DSGE-model is, I next take a look at the New Area-Wide Model which is a micro-founded open-economy model for forecasting and policy analysis created by ECB.

## **New Area-Wide Model (NAWM)**

This section takes a closer look of the New Area-Wide Model (NAWM) (Christoffel et al., 2008), which was created for the Macroeconomics Projection Exercises regularly undertaken by ECB/Eurosystem staff and for policy analysis. The NAWM -model is mainly based on neoclassical assumptions (e.g. households and firms maximize their lifetime utility, thus being forward looking) but it has some Keynesian features in the short run such as sticky prices and wages. For being able to provide a comprehensive set of variables and allow conditioning on monetary, fiscal and external developments, the scale of the model is relatively large containing 18 key macroeconomic variables.

The NAWM recognizes four types of economic agents: households, firms, a fiscal authority and a monetary authority. In the model, households maximize their lifetime utility and are able to smooth their consumption by accumulating physical capital and by buying and selling different kinds of bonds. In other words, households act Ricardian meaning they base their consumption and investment decisions on this period based on the present value of their future income. Also, households are an important part of labor markets, since they offer their differentiated labor services and act as wage setters in monopolistically competitive markets.

The NAWM recognizes two types of monopolistically competitive intermediate-good firms: domestic intermediate-good firms and foreign intermediate-good firms. Also, there are a set of three domestic final-good firms which combines the previously mentioned intermediate goods into three distinct non-tradable final goods meaning a private consumption good. In the model, domestic intermediate-good firms produce a differentiated intermediate good and the technology is determined by an increasing-returns-to-scale Cobb-Douglas. In this model, products are sold under monopolistic competition meaning that a firm can set its prices domestically and abroad. Also, foreign firms set their price in a monopolistic competition in the local currency with some assumptions of slow price adjustment. Finally, the domestic final-good firms combine the previous intermediate goods into three different types of non-tradable final goods (a private consumption good, private investment good, public consumption good) using a constant returns-to-scale CES technology. The final-good firm takes the prices of domestic and imported intermediate-goods as

given and optimizes the use based on the prices. With these assumptions we can derive the aggregate demand for the intermediate-goods and the price for the final-good.

In the NAWM, the role of the fiscal authority is to purchase the final public consumption good mentioned before, issue bonds for financing its outstanding debt and take care of collecting taxes. The fiscal authority is bound by the budget constraint. As said earlier, exogenously determined public consumption is modelled to follow the Ricardian equivalence. This leads to the situation where in the model it is assumed that lump-sum taxes close the fiscal authority's budget constraint each period. Lump-sum taxes are taxes that are the same amount for every person not depended on the income level of the person e.g. property taxes.

In the model, the monetary authority sets its nominal interest rate based on a log-linear interest-rate rule, which has lots of similarities with the traditional Taylor-type rule. The rule takes into account the logarithmic deviations of the following factors: consumer price inflation, long-run inflation objective and aggregate output from the trend output.

There are several reasons why I took a closer look around the New Area Wide Model, which is a DSGE model used by the ECB. First, in my thesis I aim to study the multiplier effect from the European point of view. In this sense it is crucial to understand the model ECB uses to make its estimations and policy recommendations even on basic level. Second, because most of the studies done in the recent years, which will be reviewed later on this thesis, are usually done with some kind of DSGE-models therefore making it important to understand the basics of these models. Third, after taking a closer look at one DSGE-model, it is easier to understand different models, e.g. the extended NAWM-model used in one of the studies reviewed in this thesis.

## 4 Key factors determining the fiscal multiplier

This chapter reviews the current literature on how three key components affect the size of the fiscal policy multiplier. First, the effect of the interest rates and monetary policy is reviewed. Second, the government debt and closely related actions of households are discussed in detail. Finally, the

fiscal policy multipliers of revenue side fiscal policy actions are compared to those of expenditure side actions.

## 4.1 Interest rate and the zero lower bound

After the financial crisis started, both the Fed and ECB lowered their key interest rates (appendix 5). ECB's key interest rate for main refinancing operations has been close to or at the zero lower bound for some time now. Zero lower bound is a situation where the nominal interest rate set by the central bank is zero and can't be lowered anymore because of practical obstacles, e.g. household start to keep cash instead of keeping their money in the bank. This means that the real interest rate is too high to encourage enough spending and investment to boost the aggregate demand. In the case of zero lower bound, there is typically also a situation of liquidity trap. Liquidity trap is the case where monetary policy loses its effectiveness because money and bonds are practically substitutes (Krugman et al., 1998). The central bank has no power since increasing the money supply doesn't show as higher inflation.

The history has taught us the potential that the fiscal policy may have when the zero lower bound is binding. Studies have shown that government multiplier can be over one when the zero lower bound is considered to be binding (e.g. Christiano et al, 2009; Woodford, 2011). Still, the fiscal policy loses fast its effect when the ZLB constraint is considered to be only temporary. Eggertsson (2010) has even more staggering result using a New Keynesian DSGE -model, the government spending multiplier can be even five times bigger and can be over 2 when facing the ZLB while also emphasizing the need to commit to inflation. Cogan et al. (2009) conclude that the monetary accommodation increases the multiplier with the notion that in order for crowding-in to happen, at least two years' continuum at the zero lower bound needs to be anticipated.

Studies that focus on the effects of EERP found out that monetary accommodation increases the fiscal policy multiplier significantly, and, depending on the model used, can be over one (e.g. Cwik & Wieland, 2011; Coenen et al., 2013). Also, Farhi and Werning (2012) confirm that there is a potential for large multipliers during liquidity traps even though they show that in a currency union the self-financed multiplier is low and below unity. It can be concluded that there is a broad

consensus among researchers about the effectiveness of fiscal policy when facing the zero lower bound.

In a normal economic situation, monetary policy responses have been dictated by a policy rule called the Taylor rule. Taylor (1993) showed, using empirical data, that central banks change their key interest rates based on changes in two key factors: changes in the price level, i.e. inflation, and changes in real income. In other words, changes in government spending should be met by changes in real interest rates which decreases the willingness to invest. This phenomenon is called the crowding out effect and it leads to lower government spending multiplier. When the central bank follows the Taylor rule, the government spending multiplier is less than under the binding ZLB constraint (e.g. Christiano et al. (2009), Eggertsson (2010), Woodford (2011)).

In conclusion, based on the literature reviewed here, the multiplier for government spending in European countries, in the context where ECB is facing the zero lower bound, can potentially be higher than in normal times if two important conditions are met. First, the zero lower bound must be binding for a longer time period, not just temporarily. If discretionary fiscal policy were going to be used, forward guidance could be used as one of the unconventional monetary policy tools to ensure that the future nominal interest rates continue being at the lower bound. Since the central bank is an independent institution, this is more easily said than done. Second, discretionary fiscal policy usually raises the government debt levels which can have an effect on the behavior of households.

## 4.2 Government debt and Ricardian households

As stated earlier, government debt as a % of the GDP has risen significantly in the euro area level since the crisis started and is now over 90 % (appendix 3). This significantly exceeds the level considered excessive in the ECB's Stability and Growth Pact (SGP). SGP states that government debt is excessive if it exceeds 60 % of annual GDP. Most euro area countries, excluding some small countries such as Baltic countries, Luxembourg and Slovakia, have exceeded the limit defined by the SGP. In this part I discuss what is the role of government debt when determining optimal fiscal policy and finding out the multiplier.



Ricardian equivalence is an idea originally suggested by David Ricardo. It is one the traditional ways of explaining why additional government spending by increasing budget deficits don't have an effect on GDP. The basic idea is that all the debt taken by the government must be paid back and taking debt necessarily leads to higher future taxes in future. If the households are forward-looking, they understand this and instead of spending the additional income followed by the government spending they save it for future taxes. Barro (1988) argued that empirical findings mainly support the Ricardian point of view even though the results are sometimes inconclusive. He also stated that Ricardian approach will become the benchmark model for assessing fiscal policy and this can be seen on the current models that asses' the fiscal policy multipliers. What is the stance of the literature reviewed here on the Ricardian assumptions?

It's clear that one reason why different models get different results when calculating the fiscal policy multiplier are the assumptions whether households act Ricardian or not. Cogan et al. (2009) studied the differences between New Keynesian versus Old Keynesian models regarding the multiplier in the United States. The main differences in the models was that the New Keynesian model by Smets/Wouters had forward-looking agents. They found out that the New Keynesian government multipliers were smaller both in the version where the interest rate were locked for one year and for two years.

Gali et al (2007) provide an extended New Keynesian model that allows rule-of-thumb consumers that makes them profoundly different from the coexisting Ricardian consumers. According to Gali et al., these rule-of-thumb consumers spend all of their current income fully and thus don't take into account future taxes. This makes Gali's model different compared to the New Area Wide – model for example. Assumptions of a significant share of rule-of-thumb customers relate with an everyday life observation of having met people who live hand-to-mouth. In the current literature reviewed later, we can see that most of the models used, have a share of non-Ricardian consumers.

Gali found out with his assumptions that it's possible to generate a positive government spending multiplier which depends on the amount of rule-of-thumb consumers which can be seen in the figure 2. In the picture with competitive labor market, the output multiplier reaches 1 when the

share of rule-of-thumb consumers exceeds approximately 0.6. The effect of rule-of-thumb customers is even larger when the labor market is modelled to be imperfect and the crowding-in of private consumption is reached at 0.25. Other studies have made assumptions about the actual rule of thumb share and use Gali's work as reference.

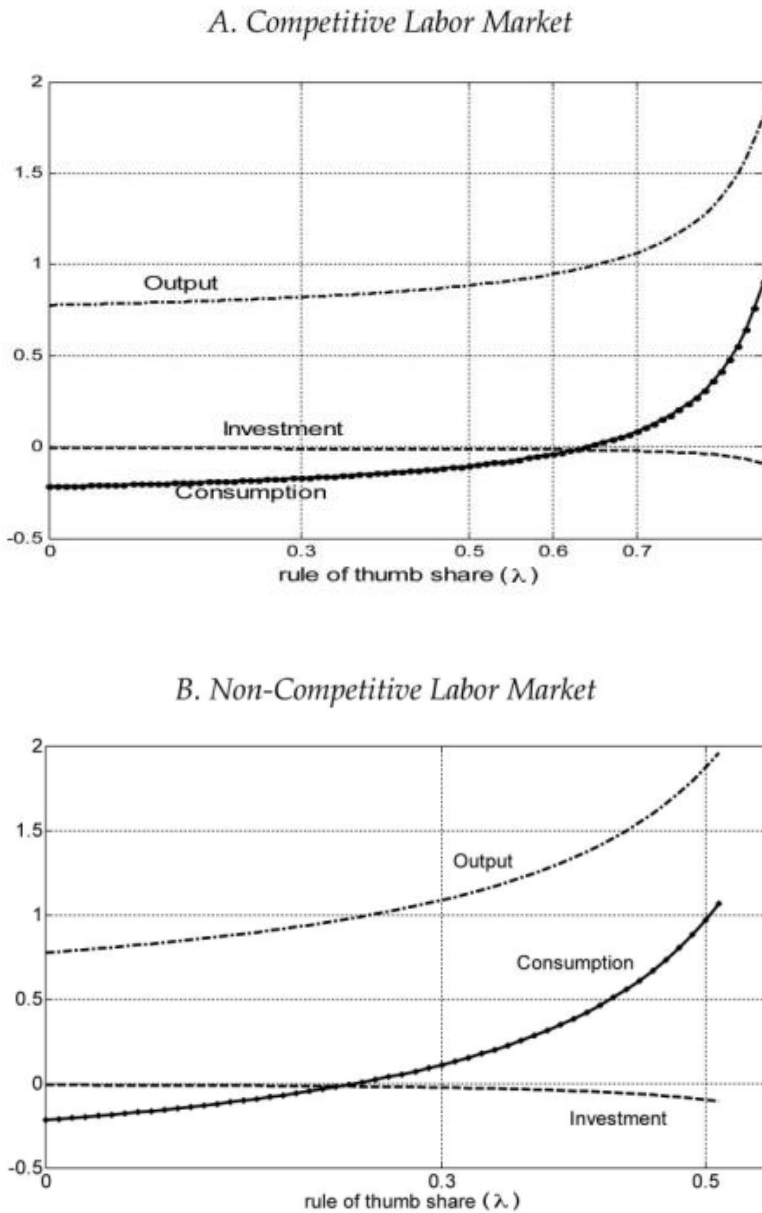


FIGURE 3. Impact multipliers: sensitivity to  $\lambda$ .

Note: Baseline calibration for remaining parameters.

Figure 2: Impact multipliers: sensitivity to rule of thumb share  
Source: Gali, 2007

Forni et al. (2009) argue that in the euro area, a significant share of the agents are non-Ricardian and that the government spending on the expenditure side has a small and short lived expansionary effects on private consumption. Their study is review more in detail in the next chapter when the government expenditure versus revenue side fiscal policy actions are discussed.

Cwik and Wieland (2011) studied the government spending multiplier in euro area using one traditional Keynesian style and four New-Keynesian models that include forward-looking behaviour with rule-of-thumb customers ranging between 0-35 percent. Their result state that in the New-Keynesian models crowding-out occurs from the start and the cumulative impact of the planned additional government purchases on euro area private sector spending over four years is negative (figure 3). Also, they found out that the only model that gives positive multiplier for the first two years following the stimulus is the ECB's area-wide model which ignores the forward looking customer. Still, it is worth mentioning that in their models, the short-run multipliers are positive even though they under unity, implying that the EERP had positive effects.

Furthermore, Cwik and Wieland suggest, based on the three New-Keynesian DSGE-models, that government spending cuts may induce significant short-run stimulus and crowding-in of private spending if the cuts are announced two years before implementation. This is a totally contradictory view compared to others that have been reviewed in this thesis before. On the other hand, austerity and spending cuts seems to have been a growing trend over the recent years in the euro area.

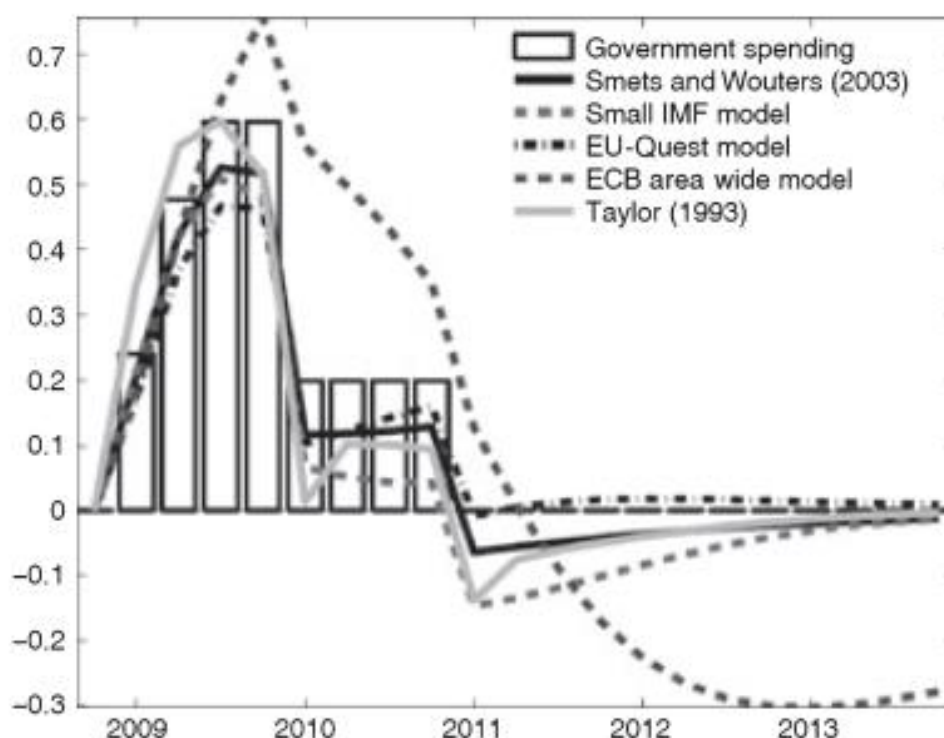


Figure 3: Estimated GDP impact of government spending stimulus

Source: Cwik & Wieland (2011)

Also, Coenen et al. (2013) studied the effects of the EERP using an extended version of the ECB's New Area-Wide model presented earlier and their analysis was related to the study conducted by Cwik and Wieland (2011). Their model takes into account non-Ricardian households and fiscal rules governing the adjustment of fiscal policy for example. Their results concluded that fiscal multipliers for government consumption and investment can be higher than one if the monetary policy is accommodating. They state that the EERP had a sizable but short-lived impact to output and the multiplier being under unity while questioning the effects of the rising debt levels. They demonstrated the effect of the EERP with a figure that compares the real annualized quarterly growth rate to the growth rate which could have been without the stimulus package (see figure 4). The growth would have been significantly more negative without the EERP. It can be concluded that the EERP had significant positive effect without taking into account the effects of cumulating debt levels in the euro area.

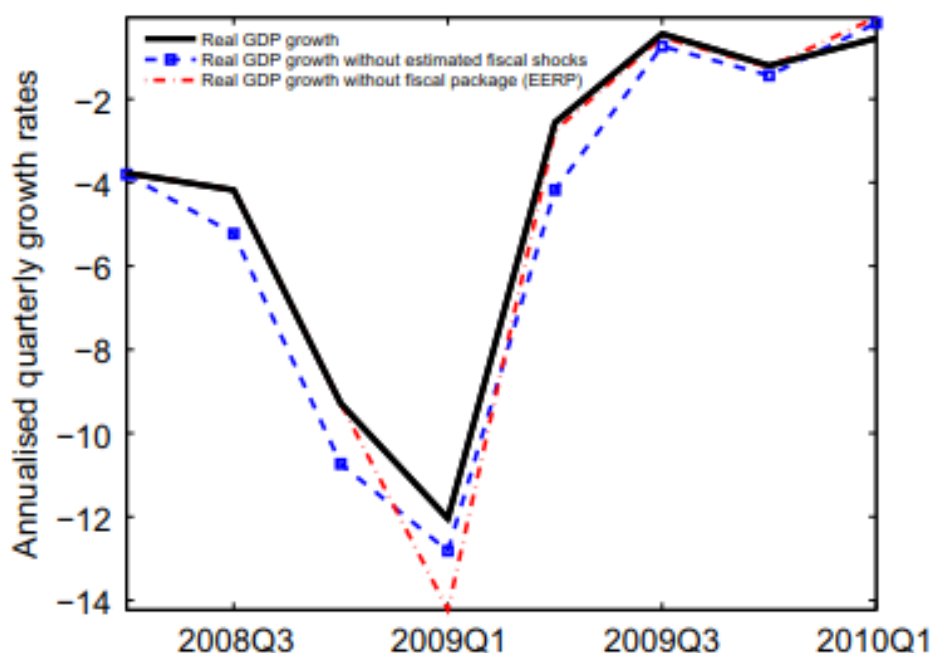


Figure 4: Euro area real GDP growth and the effects of fiscal stimulus

Source: Conen et al. (2013)

In summary, the assumption whether the households are Ricardian or not plays a key role in the models when studying the size of the multiplier. The New Keynesian models with both Ricardian and non-Ricardian households seems to be the future trend when calculating the fiscal policy multiplier. Based on these studies, it can be concluded that under realistic assumptions the multipliers are positive but under unity.

The case has to be made, whether fiscal stimulus should be applied to the current situation under many considerations. First, the amount of assumed non-Ricardian households is a determinant of the multiplier. Second, as mentioned earlier, once again the interest rates must be taken into account meaning that accommodative monetary policy at the ZLB gives higher multipliers. Third, the future effects of the growing debt levels should be emphasized and it is a subject for further studies.

### 4.3 Revenue side fiscal policy

The focus of this review, in accordance with the studies reviewed, on the effects of government spending. However, tax cuts could be used as a fiscal stimulus as well. As we saw earlier, 52 per cent of the EERP fiscal stimulus package concentrated on the revenue side. This raises the question of how tax cuts compare to additional government spending and whether and how they should be a part of fiscal stimulus. In this section, I review the current literature's stance on tax cuts.

Eggertsson (2010) found, using a New Keynesian DSGE -model from the United States' viewpoint, that during positive interest rate the fiscal policy multiplier for labor and capital tax cut is slightly positive for the former. The multiplier for the latter is zero. In the case of zero interest rate, which is the situation today, multipliers are slightly negative for labour tax cuts and strongly negative for capital tax cuts. Eggertsson continues emphasizing the importance of focusing on the aggregate demand side while facing the ZLB for two reasons. First, cutting labor costs decrease the cost of firms and this in turn causes deflationary pressures and in the end causing higher real interest rate which can't be lowered by the central bank. Second, cutting capital taxes encourages saving instead of spending, the effect is opposite to the objective. This model assumed that wages are flexible which is quite an unrealistic scenario. Also, the assumption of perfectly forward-looking households has to be questioned.

Forni et al. (2009) studied the effects of fiscal policy both on the expenditure and revenue side in the Euro area using a DSGE-model with rule-of-thumb consumers demonstrated in the previous chapter. Their study was conducted before the global financial crisis had started. They found that the share of non-Ricardian households does not have a significant effect on the fiscal policy multipliers of capital income or consumption tax cuts. In contrast to Eggertsson's finding, the multipliers for capital income tax cuts is around 0.4 and for consumption tax cuts is in the range of 0.6-0.9. On the other hand, labor income tax is highly dependent on the share of rule-of-thumb customers. Output and private consumption grows hand in hand with the share of these customers and the multiplier is around 0.5 when there are the same amount of Ricardian and non-Ricardian customers. Also, they found out that the revenue-side fiscal policy has more sizable and lasting

effects on output and consumption. This is a completely different view compared to others reviewed in this chapter.

Coenen et al. (2013) had somewhat similar result compared to Forni et al. (2009). Studying EERP, they found that the present-value fiscal multipliers for consumption taxes are positive while being under 0.5 and the multipliers for labor income tax cuts were slightly positive and in the long run around 0.15. In this model, there is a share of non-Ricardian households which makes it more believable compared to the estimates of Eggertsson. Still the multiplier is much less than the ones from government consumption. Also, it is worth mentioning that their result state that in the long run government investment i.e. infrastructure creates the largest multiplier being over one.

When considering tax cuts, the effect on wealth distribution should be taken into consideration. For example, cuts on capital income tax cuts affect only a portion of the population. Consumption taxes seem to have higher multipliers and they affect the whole population.

Based on the literature, there is not a full agreement on the effectiveness of tax cuts. Still, the studies made in the European context indicate that the multiplier for the euro area revenue-side spending is slightly positive even though not as effective as additional government spending. It is important to carefully consider what kind of taxes are cut. Studies indicate that the highest multipliers come from consumption tax cuts.

## 5 Conclusion

The purpose of this thesis was to study the effects of the EERP in the aftermath of the global financial crisis by reviewing the current literature. This literature review focuses on the fiscal policy multiplier mainly from three different viewpoints after establishing the economic background. First, interest rates are considered as one of the most important background factors when determining the multiplier. Second, household behavior in the form of rule of thumb customers is regarded as an important factor. Finally, the difference between revenue and expenditure side fiscal policy is discussed.

Based on the literature review, it seems clear that the EERP was launched for several valid reasons. First, monetary policy was insufficient at the time and the key interest rates were approaching the zero lower bound, which made room for effective fiscal policy. In addition, at the time of the launch, the debt levels were more moderate, indicating that on the euro level fiscal stimulus could be afforded which might not be the case today.

Newer studies, that look at the effect of EERP, have widely used DSGE- models which include both Ricardian and non-Ricardian households (e.g. Cwik & Wieland, 2011; Coenen et al., 2013). These New Keynesian models indicate that fiscal stimulus was moderately effective in the economic situation that prevailed at the time EERP was launched. These studies emphasized the importance of accommodating monetary policy which has been the case when observing the key interest rates by the ECB in the recent years.

When comparing the effectiveness of revenue side versus expenditure side fiscal policy, the studies give support to expenditure-side spending in the euro context. The effectiveness of tax deductions depend on two factors. First, it matters what kind of taxes are cut. Studies indicate that the highest multipliers come from cutting consumption taxes. Second, once again, the amount of non-Ricardian households act as a factor determining the multiplier.

In summary, EERP had relatively sizable effects on the real GDP growth. Without the fiscal stimulus, the European growth levels would have been less positive or even more negative. This should not be seen as a definitive argument for government spending since the long-term effects of fiscal stimulus e.g. the effects of growing government debt levels were outside the focus of this thesis. Moreover, only some of the factors determining the multiplier were discussed in this thesis.



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## Appendix

### List of appendix

1. GDP in prices of the previous year (economic growth) in the euro area
2. Government debt (as a % of GDP) in the euro area
3. Unemployment rate (as a % of labor force) in the euro area
4. Inflation rate (HICP) in the euro area
5. European Central Bank's key interest rates

A1: GDP in prices of the previous year (economic growth) in the euro area 2007 - 2016

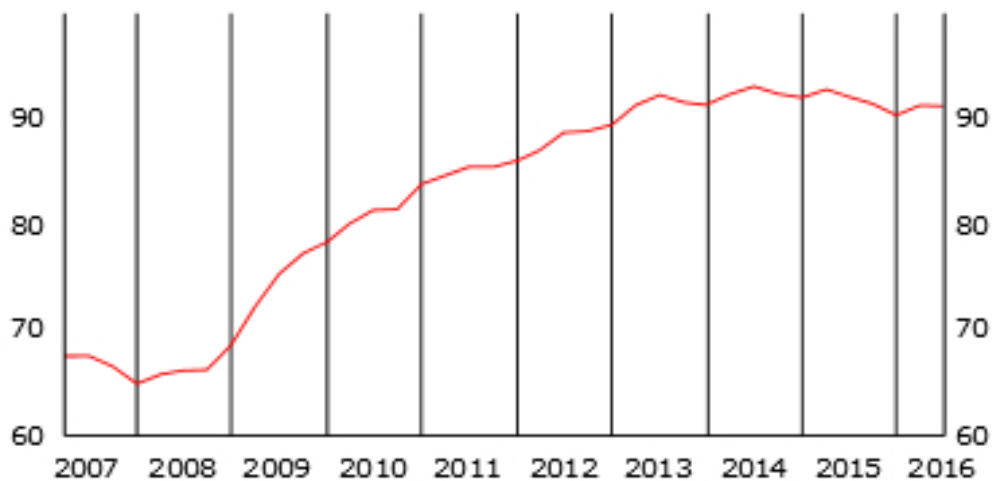


Gross domestic product at market prices, Growth rate, over 1 year, Calendar and seasonally adjusted data

Source: European Central Bank

[http://sdw.ecb.europa.eu/print.do?printType=full&SERIES\\_KEY=320.MNA.Q.Y.I8.W2.S1.S1.B.B1GQ.Z.Z.Z.EUR.LR.GY&node=qview](http://sdw.ecb.europa.eu/print.do?printType=full&SERIES_KEY=320.MNA.Q.Y.I8.W2.S1.S1.B.B1GQ.Z.Z.Z.EUR.LR.GY&node=qview)

A2: Government debt (as a % of GDP) in the euro area 2007 - 2016

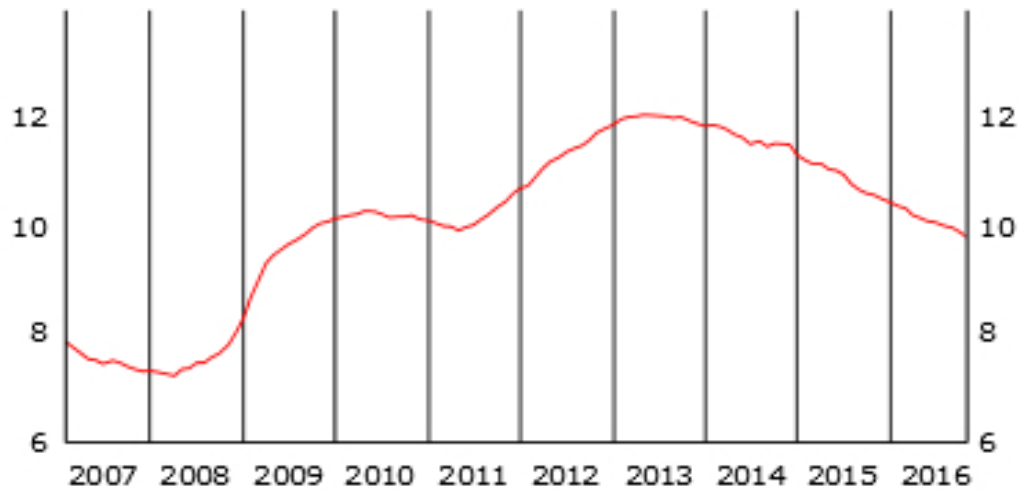


Government debt; face value; quarterly; neither seasonally nor calendar adjusted

Source: European Central Bank

[http://sdw.ecb.europa.eu/quickview.do?SERIES\\_KEY=325.GFS.Q.N.I8.W0.S13.S1.C.L.LE.GD.T.Z.XDC.R.B1GQ.CY.T.F.V.N.T](http://sdw.ecb.europa.eu/quickview.do?SERIES_KEY=325.GFS.Q.N.I8.W0.S13.S1.C.L.LE.GD.T.Z.XDC.R.B1GQ.CY.T.F.V.N.T)

A3: Unemployment rate (as a % of labor force) in the euro area 2007 - 2016

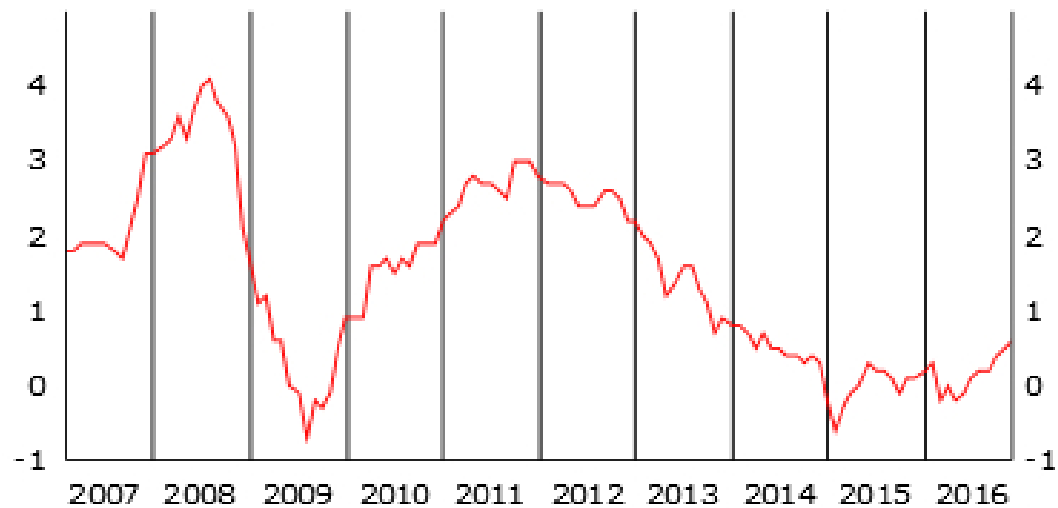


Standardized unemployment rate; Seasonally adjusted; not working day adjusted; monthly data

Source: European Central Bank

[http://sdw.ecb.europa.eu/print.do?printType=full&SERIES\\_KEY=132.STS.M.I8.S.UNEH.RTT000.4.000&node=qview](http://sdw.ecb.europa.eu/print.do?printType=full&SERIES_KEY=132.STS.M.I8.S.UNEH.RTT000.4.000&node=qview)

A4: Inflation rate (HICP) in the euro area 2007-2016

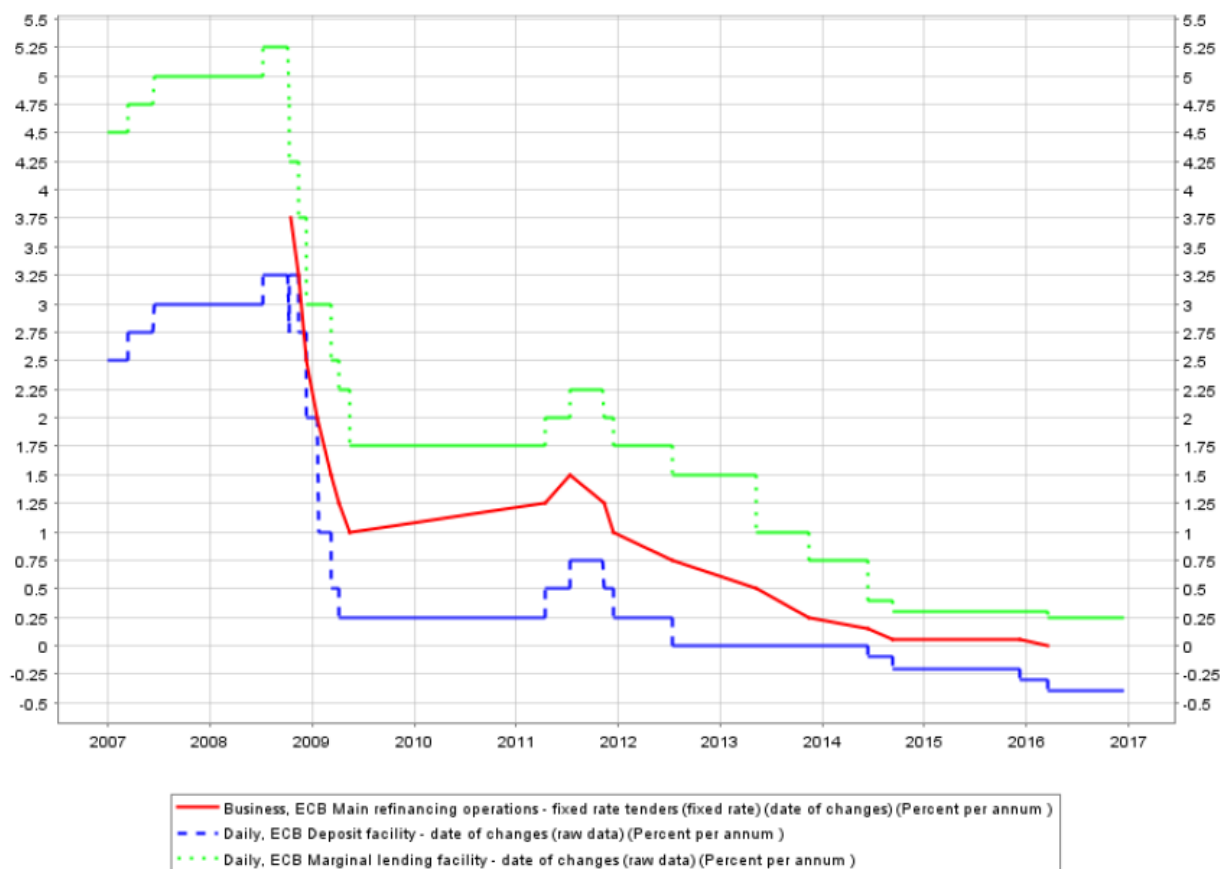


HICP- overall index, Annual rate of change; Neither seasonally nor working day adjusted

Source: European Central Bank

[http://sdw.ecb.europa.eu/print.do?printType=full&SERIES\\_KEY=122.ICP.M.U2.N.000000.4.ANR&node=qview](http://sdw.ecb.europa.eu/print.do?printType=full&SERIES_KEY=122.ICP.M.U2.N.000000.4.ANR&node=qview)

## A5: European Central Bank's key interest rates 2007-2016



Source: European Central bank

[http://sdw.ecb.europa.eu/print.do?node=9691107&SERIES\\_KEY=143.FM.B.U2.EUR.4F.KR.MRR\\_FR.LEV&SERIES\\_KEY=143.FM.D.U2.EUR.4F.KR.DFR.LEV&SERIES\\_KEY=143.FM.D.U2.EUR.4F.KR.MLFR.LEV&printType=chart](http://sdw.ecb.europa.eu/print.do?node=9691107&SERIES_KEY=143.FM.B.U2.EUR.4F.KR.MRR_FR.LEV&SERIES_KEY=143.FM.D.U2.EUR.4F.KR.DFR.LEV&SERIES_KEY=143.FM.D.U2.EUR.4F.KR.MLFR.LEV&printType=chart)